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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SMITH, JENNIFER A	

ART UNIT	PAPER NUMBER
1793	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/710,920	JEN ET AL.	
	Examiner	Art Unit	
	JENNIFER A. SMITH	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *08/14/2009, 10/27/2009*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Application

Claims 1-18 and 24 have been amended.

Claims 1-29 are pending and presented for examination.

Information Disclosure Statements

The information disclosure statements (IDS) submitted on 08/14/2009 and 10/27/2009 are compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements has been considered by the examiner.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 8, 10-15, 18, 20, 22, 24, 25, 28, and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Miura et al. (US Patent No. 5,427,753).

In regard to claim 1, Miura et al. teaches a catalyst for removing nitrogen oxides from exhaust gas. The catalyst is composed of a zeolite, a phosphorous-containing compound, and an active metal [See Column 2, lines 15-20]. Phosphorous is incorporated into the zeolite material by an impregnation method, physical mixing, or

other methods [See Column 2, lines 35-59]. The type of phosphorous compounds used are preferably phosphoric acids or phosphates [See Column 2, lines 60-62]. The phosphorous-containing zeolite may be ion exchanged with barium [See Column 2, lines 33-34]. The ion exchange method is taught using another alkaline earth metal in Miura's Example 8 and the cation is not washed out of the final composition. Instead the alkaline earth metal and phosphorous-contain zeolite and active metal form the catalyst composition. Miura et al. does not explicitly disclose the conjugate base oxide of an inorganic acid with any specific K_a. However, this is an inherent characteristic of the conjugate base oxides taught by Miura. Applicant's use of the same material for the same function confirms that barium phosphate has the same K_a values as required in the instant claims and therefore resists surface-area-reducing phase transitions [See Applicant's Specification, Paragraph 0029].

In regard to claims 2 and 3, Miura et al. does not explicitly disclose the conjugate base oxide of an inorganic acid with any specific K_a. However, this is an inherent characteristic of the conjugate base oxides taught by Miura. Applicant's use of the same material for the same function confirms that barium phosphate has the same K_a values as required in the instant claims and therefore resists surface-area-reducing phase transitions [See Applicant's Specification, Paragraph 0029].

In regard to claims 8 and 11, the method of incorporation of the phosphorus into the zeolite can include impregnation using an aqueous solution or by physical mixing of

the phosphorous compound [See Column 2, lines 30-59]. In regard to claim 8, Miura does not explicitly teach grinding the fine particles. The reference teaches a product that appears to be the same as the product set forth in a product-by-process claim although produced by a different process. See In re Marosi, 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) and In re Thorpe, 777 F.2d 695, 227 USPQ 964 (Fed. Cir. 1985). See also MPEP § 2113.

In regard to claims 10, 12, and 13, Miura et al. teaches incorporating the phosphorous into the zeolite (SiO_2/Al_2O_3 composition) support [See Column 2, lines 14-19 and 60-63].

In regard to claims 14 and 15, one or more active metals are introduced to the catalyst including platinum [See Column 3, lines 21-22 and 27].

In regard to claims 18, 20, 22, Miura et al. teaches a catalyst for removing nitrogen oxides from exhaust gas. The catalyst is composed of a zeolite, a phosphorous-containing compound, and an active metal [See Column 2, lines 15-20]. Phosphorous is incorporated into the zeolite material by an impregnation method, physical mixing, or other methods [See Column 2, lines 35-59]. The type of phosphorous compounds used are preferably phosphoric acids or phosphates [See Column 2, lines 60-62]. The phosphorous-containing zeolite may be ion exchanged with barium [See Column 2, lines 33-34]. The ion exchange method is taught using

another alkaline earth metal in Miura's Example 8 and the cation is not washed out of the final composition. Instead the alkaline earth metal and phosphorous-contain zeolite and active metal form the catalyst composition. Miura et al. does not explicitly disclose the conjugate base oxide of an inorganic acid with any specific K_a. However, this is an inherent characteristic of the conjugate base oxides taught by Miura. Applicant's use of the same material for the same function confirms that barium phosphate has the same K_a values as required in the instant claims and therefore resists surface-area-reducing phase transitions [See Applicant's Specification, Paragraph 0029].

In regard to claims 24-25, Miura et al. teaches a method for treating an exhaust gas using a catalyst. The coarsening resistant automotive exhaust catalyst and all of its limitations are disclosed in the Miura reference and therefore the reference also anticipates the method of inhibiting coarsening in an automobile exhaust catalyst by using the disclosed catalyst. The method of introduction of the active metal into the zeolite catalyst is not limited in the Miura reference. Impregnation or ion exchange may be used [See Column 3, lines 31-41]. The phosphorous-containing zeolite may be ion exchanged with barium [See Column 2, lines 33-34]. The ion exchange method is taught using another alkaline earth metal in Miura's Example 8 and the cation is not washed out of the final composition. A phosphate-containing zeolite in which the alkaline earth element is present is observed in an XRD pattern. The phosphorus-containing, alkaline earth containing zeolite is mixed with an aqueous solution of active metal (copper in Example 8) [See Column 6, line 48 - Column 7, line 4].

In regard to claims 28 and 29, one or more active metals are introduced to the catalyst including platinum [See Column 3, lines 21-22 and 27].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 4-7, 16, 19, 21, 23, 26, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (US Patent No. 5,427,753) as applied to claims 1, 3, 20, 24, and 25 above, and further in view of Nunan (US Patent No. 5,064,803).

In regard to claims 4, 5, 21, 23, 26, and 27, Miura fails to teach doping a gamma-alumina compound.

The Nunan reference is drawn to a catalyst for use in converting exhaust gases. The support used taught by Nunan is alumina, particularly the gamma and delta forms, which typically have a surface area of about 50 to 300 m^2 /g.

One of ordinary skill in the art, at the time of Applicants invention, would be motivated to use a gamma alumina component because the large surface area serves to provide increased contact between the catalytic material and the exhaust gases [See Nunan, Column 3, lines 31-34].

In regard to claims 6, 7, and 19, the Miura reference fails to teach a preferred weight percentage of the metal compound.

Nunan teaches barium in the catalyst composition, acting as a promoter. The amount of the promoter will be about 1 to 20 wt % based on the catalyst [See Column 5, lines 40-42].

One of ordinary skill in the art, at the time of Applicant's invention, would have been motivated to provide the barium bonded to a phosphate in an amount similar to the amount taught in the Nunan reference in an amount useful for depositing ceria or other active metals [See Nunan, Column 5, lines 36-39]. Furthermore, this represents optimization within prior art conditions through routine experimentation. Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges

by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). See MPEP 2144.05 IIA.

In regard to claim 16, the Miura reference fails to teach a cerium containing oxide.

The Nunan reference is drawn to a catalyst for use in converting exhaust gases. The catalyst contains ceria, in a cerium oxide compound.

One of ordinary skill in the art would have been motivated, at the time of Applicant's invention to include a ceria oxide compound because it is considered to be an oxygen storage component and is believed to have many valuable functions in a catalyst arrangement [See Nunan, Column 49-51].

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (US Patent No. 5,427,753) as applied to claim 1 above, and further in view of Cai et al. (US Patent Publication No. 2003/0139288 A1).

Miura et al. teaches all of the limitations of claim 1 but fails to teach any explicit size required with regard to the conjugate base oxide particles.

Cai et al. teaches a method of making a catalyst in which small catalyst particles are dispersed on the surface of larger catalyst carrier particles. More specifically, it relates to using a dry-coating process to coat nanometer-sized catalyst particles on the surface of larger catalyst carrier particles. The dry-coated catalyst particle/carrier particle composite mixture is then adapted for a catalyst application, such as in automotive exhaust gas treatment [See Page 1, Paragraph [0001]].

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to mill the barium phosphate taught by Miura to a size range consistent with the teachings of Cai because Cai teaches that coating with nanosized particles yields high effective surface area of the catalyst particles on the catalyst carrier [See Page 1, Paragraph [0009]].

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (US Patent No. 5,427,753) in view of Nunan (US Patent No. 5,064,803) and further in view of Cuif (US Patent No. 5,747,401).

The Miura and Nunan references teach all of the limitations of claim 16 but fail to teach the cerium oxide to be a mixed oxide.

Cuif teaches mixed oxides of cerium and zirconium are used for many applications, including catalysts used in automotive catalytic converters

It would have been obvious to one of ordinary skill in the art, at the time of the invention, to utilize the mixed oxides taught in Cuif because they are known to improve catalytic function in exhaust gas treatment systems such as those taught in Miura and Nunan.

Response to Arguments

Applicant's arguments filed 10/27/2009 have been fully considered but they are not persuasive.

Applicants argue Miura et al. do not teach or suggest incorporating barium phosphate into the catalyst and therefore does not teach or suggest a catalyst comprising “barium metal ions bonded to a conjugate base oxide of an inorganic acid”. The catalyst is composed of a zeolite, a phosphorous-containing compound, and an active metal [See Column 2, lines 15-20]. Phosphorous is incorporated into the zeolite material by an impregnation method, physical mixing, or other methods [See Column 2, lines 35-59]. The type of phosphorous compounds used are preferably phosphoric acids or phosphates [See Column 2, lines 60-62]. The phosphorous-containing zeolite may be ion exchanged with barium [See Column 2, lines 33-34]. The ion exchange method is taught using another alkaline earth metal in Miura’s Example 8 and the cation is not washed out of the final composition. Instead the alkaline earth metal, phosphorous-contain zeolite, and active metal form the catalyst composition. The

method of forming the catalyst taught in the Miura reference is substantially similar to the preparation method taught in Example C of the present specification [See Page 20] therefore one of skill in the art would recognize the claimed material and the material taught in the prior at have the same characteristics - namely barium metal ions bonded to a phosphorus oxide.

Applicants argue the examples provided in Miura et al. do not teach or suggest any barium in the composition of the catalyst and that the barium cations wash out. Miura et al. teach a zeolite ion exchanged with barium [See Column 2, line 34]. Although barium is not present in any of the examples, in Examples 7-9, an alkali or alkaline metal is ion-exchanged with the phosphorous-containing zeolite composition. One would expect a similar mechanism for the inclusion of a barium compound. Although barium is not present in the exemplified embodiments, Miura et al. discloses the optional presence of the alkaline earth metal in the catalyst composition as shown.

Applicants argues that barium phosphate may be used as a vehicle for incorporating phosphorus into the zeolite substrate and the barium cations do not become part of the final catalyst product. Phosphorous is incorporated into the zeolite material by an impregnation method, physical mixing, or other methods [See Column 2, lines 35-59]. The type of phosphorous compounds used are preferably phosphoric acids or phosphates or barium phosphate [See Column 2, lines 60-62]. The phosphorous-containing zeolite may be ion exchanged with barium [See Column 2,

lines 33-34]. The ion exchange method is taught using another alkaline earth metal in Miura's Example 8 and the cation is not washed out of the final composition. Instead the alkaline earth metal and phosphorous-contain zeolite and active metal form the catalyst composition.

Applicants argue the Nunan reference does not teach or suggest barium metal ions bonded to a phosphorus oxide. This argument is not persuasive because it has been shown about that the Miura reference teaches the preparation of a catalyst material the meets the limitations of claim 1. The Nunan reference is merely cited to remedy the deficiencies of the Miura reference with respect to the catalyst support composition and the preferred weight percentages of the catalyst metals present on this support.

Applicants arguments drawn to the dependent claims are not persuasive for the reasons given above with respect to the dependent claim rejections based on the Miura reference.

Conclusion

Claims 1-29 remain rejected.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JENNIFER A. SMITH whose telephone number is (571)270-3599. The examiner can normally be reached on Monday - Friday, 8:30am to 5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571)272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENGO/
Supervisory Patent Examiner, Art Unit 1793

Jennifer A. Smith
December 18, 2009
Art Unit 1793

JS